



US008236126B2

(12) **United States Patent**
Chen et al.

(10) **Patent No.:** **US 8,236,126 B2**
(45) **Date of Patent:** **Aug. 7, 2012**

(54) **ENCAPSULATION METHOD OF ENVIRONMENTALLY SENSITIVE ELECTRONIC ELEMENT**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 95 days.

(21) Appl. No.: **12/860,945**

(22) Filed: **Aug. 23, 2010**

(65) **Prior Publication Data**

US 2012/0012246 A1 Jan. 19, 2012

(30) **Foreign Application Priority Data**

Jul. 14, 2010 (TW) 99123107 A

(51) **Int. Cl.**
B32B 38/10 (2006.01)

(52) **U.S. Cl.** **156/247**; 156/145; 156/232; 156/233; 156/239; 156/250; 264/272.11; 264/272.14

(58) **Field of Classification Search** 156/145, 156/232, 233, 239, 247, 250, 272.11, 272.14
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,083,097 A 4/1978 Anagnostou et al.
6,409,859 B1 * 6/2002 Chung 156/69
6,428,650 B1 * 8/2002 Chung 156/250

6,432,253 B1 * 8/2002 Chung 156/295
6,764,369 B2 7/2004 Lai et al.
6,803,245 B2 * 10/2004 Auch et al. 438/26
6,869,329 B2 3/2005 Clark
6,888,172 B2 5/2005 Ghosh
6,949,825 B1 9/2005 Guenther et al.
7,135,352 B2 11/2006 Yokajty et al.
7,368,307 B2 5/2008 Cok

(Continued)

FOREIGN PATENT DOCUMENTS

TW 200505271 2/2005

(Continued)

OTHER PUBLICATIONS

Lungenschmied et al., "Flexible Encapsulation for Organic Solar Cells," Proc. of SPIE 6197, 2006, pp. 619712-1-619712-8.

(Continued)

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(57) **ABSTRACT**

An encapsulation method of an environmentally sensitive electronic element is provided. A first substrate is provided, wherein at least one first alignment mark and a plurality of environmentally sensitive electronic elements are formed on the first substrate. A second substrate is provided, wherein at least one second alignment mark and a plurality of limiting cavities are formed on the second substrate. A plurality of cover lids is respectively disposed in the limiting cavities. An adhesive is formed on the cover lids. The first substrate and the second substrate are laminated together with the first alignment mark and the second alignment mark as reference, so that the environmentally sensitive electronic elements are sealed in the adhesive and located between the first substrate and the second substrate. The second substrate and the cover lids are separated from each other.

13 Claims, 9 Drawing Sheets

